SOV/120-58-5-2/32

Excitation of Oscillations in an Electron Cyclic Accelerator by Quantum Fluctuations of Radiation

fluctuations of radiation are considered classically, assuming that the energy of the electrons is much larger than the energy of the quanta emitted by them. There are 2 figures and 3 Soviet references.

SUBMITTED: October 15, 1957.

Card 3/3

AUTHORS: Orlov, Yu. F. and Tarasov, Ye. K.

TITLE: Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing (Vozniknoveniye neustoychivosti pri bol'shom gradiyente v elektronnom uskoritele s zhestkoy fokusirovkoy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 15-18 (USSR)

ABSTRACT: In the presence of a large gradient (n of the order of a few hundreds) in an electron accelerator, betatron or phase oscillations may become unstable. The effect is the result of radiation and resonance irregularities in the magnetic field when they occur simultaneously.

1) The effect of resonance irregularities of the field upon the damping of phase oscillations. The effects considered in this section occur as a result of a strong dependence of radiation on the position of the electron orbit in an accelerator with strong focussing. If the orbit is displaced from the equilibrium position then the magnetic field along the orbit varies by an amount given by:

$$\Delta H_z = \left(\frac{\partial H_z}{\partial r}\right)_s r, \qquad \Delta H_r = \left(\frac{\partial H_z}{\partial r}\right)_s z \qquad (1)$$

Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

as compared with the field on an undisturbed orbit. The radiated power also varies and is given by:

$$P_\gamma = \frac{2e^4}{3m^4c^7} E^2 (H_z^2 + H_r^2) =$$

$$= P_{\gamma s}\left(1 + 2\frac{1}{H_s}\frac{\partial H_s}{\partial r} r + \frac{1}{H_s^2}\left(\frac{\partial H_s}{\partial r}\right)^2 r^2 + \right.$$

$$\left. + \frac{1}{H_s^2}\left(\frac{\partial H_s}{\partial r}\right)^2 z^2\right) \quad (2)$$

The effect of the linear term in Eq.(2) upon the damping of the oscillations has been discussed in many papers, in particular, in Refs.1 and 2. The non-linear terms have always

Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

been neglected. However, in the presence of irregularities in the magnetic field along the equilibrium orbit which may be due to, for example, innaccurate lining up of the magnets, the non-linear terms in Eq.(2) may play an important or even decisive role. As is well-known, when field irregularities are present, resonances occur which have a marked effect upon the form and the amplitude of the periodic orbit of an electron. It is shown that instability will occur when:

$$k_1 + \frac{1}{2} < M\nu < k_1 \quad ,$$

where k_1 is an integer and $M\nu$ is the number of oscillations per single turn.

2) The effect upon betatron oscillations. In betatron oscillations one expects an effect of the opposite sign as compared with phase oscillations and this is established in this section for the case of vertical oscillations. In particular, it is shown that instability occurs when:

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Appearance of Instability at Large Gradient in an Electron Accelerator with Strong Focussing

$$k_1 < M\nu < k_1 + 1/2$$

There is 1 figure and there are 2 Soviet references.

SUBMITTED: October 15, 1957.

Card 4/4

SOV/56-34-3-28/55

AUTHORS: Orlov, Yu. F., Tarasov, Ye. K.

TITLE: The Damping of the Oscillations in a Cyclic Electron Accelerator (Zatukhaniya kolebaniy v elektronnom tsiklicheskom uskoritele)

PERIODICAL: Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, 1958, Vol. 34, Nr 3, pp. 651-657 (USSR)

ABSTRACT: The damping factors of radial and phase vibrations were determined taking into account the charge of the magnetic field along the trajectory. In the first paragraph the equations for the motion of the electron in a circular accelerator are derived. The equations so found for the phase vibrations in linear approximation and for the equations of the betatron vibrations are written down here explicitly. The second paragraph discusses the damping of free radial vibrations. The fluctuations p(t) of the radiation lead to an amplification of phase vibrations and because of the interrelation of the radial with the phase vibrations also to an amplification of the radial vibrations. The vertical vibrations are not connected directly with the phase vibrations. The interrelation of the vibrations

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leads to a redistributions of the damping intensities. It is shown here, that in an accelerator with hard focusing the parameters of the damping do not depend on the distribution of the quantity $n = (\varrho_s/H_z)\,\partial H_z/\partial r$ along the trajectory. Then the authors obtain general formulas for the damping of the radial vibrations and of the phase vibrations. The damping depends on the distribution of H_z along the trajectory. Formulae are also written down, for the forced oscillation of the phase. The frequencies of the betatron vibrations are always chosen so that on the trajectory a non-integer of vibrations can be spaced. The authors here examined the case that the field in all magnets is equal. The third and last paragraph deals with the damping of the free phase vibrations and discusses the obtained results. The here obtained result have the following obvious meaning: An additional condition of the radial vibrations coincides with an additional amplification of the phase vibrations, i. e. the energy vibrations. For an amplification of the energy vibration it obviously is necessary that the increase of the energy of the particle is accompanied by a reduction of the emission. This takes place when at an increase of the energy the trajectory of the particle changes so that the mean value $\langle H^{-3}\rangle \sim \langle \varrho^{-3}\rangle$,

The Damping of the Oscillations in a Cyclic Electron Accelerator SOV/ 56-34 -3-18/55

averaged over the new trajectory, decreases. Thereby H denotes the magnetic field strength and ρ the radius of curvature of the trajectory.
There are 6 references, 4 of which are Soviet.

SUBMITTED: September 6, 1957.

Card 3/3

SOV/120-59-1-2/50

AUTHORS: Orlov, Yu. F., Tarasov, Ye. K., Kheyfets, S. A.

TITLE: The Damping of Particle Oscillations in an Electron Synchrotron with Strong Focussing (Dempfirovaniye kolebaniy chastits v elektronnom sinkhrotrone s zhestkoy fokusirovkoy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 17-20 (USSR)

ABSTRACT: It was shown in Ref.1 that radiation may lead to an instability of radial oscillations in an electron accelerator with strong focussing. By varying the magnetic field in high gradient magnets, stability may be achieved for all degrees of freedom (Ref.2). In Refs.2 and 3 formulae were given for the damping coefficients. By varying the field along the orbit these coefficients may be chosen so that during the process of acceleration particle losses are a minimum. The theory of losses due to radiation fluctuations is given in Ref.4. Using the results obtained in the above papers, a brief discussion is given of methods of damping of the oscillations by varying the magnetic field along the orbit. Among the possibilities considered are resonance damping,

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SOV/120-59-1-2/50

The Damping of Particle Oscillations in an Electron Synchrotron with Strong Focussing

complex structures in the intervals between usual magnets (Ref.5), and reduction of the field in magnets with radial focussing. There are 1 figure and 5 references, of which 4 are Soviet and 1 is English.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physical Institute, Academy of Sciences of the Armenian SSR)

SUBMITTED: November 21, 1957.

Card 2/2

TARASOV, Ye. K.

Cand Phys-Math Sci - (diss) "Several problems in the theory and calculation of accelerators with a sign-varying gradient." Moscow, 1961. 10 pp; (Physics Inst imeni P. N. Lebedev of the Academy of Sciences USSR); 200 copies; price not given; bibliography at end of text (22 entries); (KL, 6-61 sup, 195)

VLADIMIRSKIY, V.V.; KOMAR, Ye.G.; MINTS, A.L.; GOL'DIN, L.L.; MONOSZON, N.A.; RUBCHINSKIY, S.M.; TARASOV, Ye.K.; VASIL'YEV, A.A.; VODOP'YANOV, F.A.; KUSHNIKOV, D.G.; KURYSHEV, V.S.; MALYSHEV, I.F.; STOLOV, A.M.; STREL'TSOV, N.S.; YAKOVLEV, B.M.

The 7 bev. proton synchrotron. Prib. i tekh. eksp. 7 no.4:5-9 Jl-Ag '62. (MIRA 16:4)

1. Institut teoreticheskoy i eksperimental'noy fiziki Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR, Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR i Radiotekhnicheskiy institut Gosudarstvennogo komiteta po ispol'zovaniyu atomnoy energii SSSR.
(Synchrotron)

TARASOV, YE. K.

4074

S/120/62/000/004/010/047
E032/E514

AUTHORS: Vladimirskiy, V.V., Kobozev, A.S., Marfenko, S.V., Pevnev, A.K., Porubay, N.I. and Tarasov, Ye.K.

TITLE: Effect of the deformation of the foundations on the orbit of protons in a synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 66-69

TEXT: Unavoidable displacements of the ground in the vertical and horizontal directions due to seasonal variations in the temperature, humidity and so on, may give rise to relative displacements in the position of magnet sections, which in turn may produce forced oscillations of the proton beam. In the 7 GeV proton synchrotron of the GKAE the magnet is supported by a continuous solid ring which is in principle similar to that employed at CERN. The reinforced-concrete ring which supports the magnet lies directly on the ground which consists of soft morainic deposits. The relatively small dimensions of the ring (R = 40 m) ensured that it could be made sufficiently rigid and thereby minimise the effect of nonuniform settling of the ground on the orbit. The ring was placed at a depth of 5 m. A theoretical

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analysis is now given of the strength of the ring foundation by developing the displacement of the axis of the accelerator chamber due to deformation of the foundations into a Fourier series. Owing to the rigidity of the magnet sections and the small distance between neighbouring sections, the position of all the sections can be specified with sufficient accuracy by the coordinates of 112 points. The Fourier series, therefore, contain a finite number of terms. For each harmonic of the deformation one can then calculate the amplitude of the corresponding periodic orbits. Numerical calculations showed that the 13th, 43rd and neighbouring harmonics were the most dangerous. The mathematical analysis is facilitated by the fact that a mathematical solution is available for the problem of mechanical vibrations of an elastic ring (Love, Mathematical Theory of Elasticity). In their final form the foundations were in the shape of a continuous reinforced-concrete belt of square cross-section having a length of 250 m, height 5 m and width 5 m with a nett load of about 16 tons per running metre. The belt contains two circular cable tunnels (1.25 x 1.95 m^2). The analytical

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calculations and the design data were then tested experimentally by observations of the position of 28 markers attached to the foundations. Vertical and radial variations for the period 1959/62 are reported in the form of graphs, from which it is concluded that the maximum departure of the orbit from the axis of the chamber, due to the deformation of the foundations, did not exceed 1.5 mm. The amplitude of the deformations of the foundations was of the same order of magnitude (about 1 mm). There are 2 figures and 2 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE
(Institute of Theoretical and Experimental Physics GKAE)

SUBMITTED: March 31, 1962

10754

S/120/62/000/004/028/047
E140/E420

24.6740

AUTHOR: Tarasov, Ye.K.

TITLE: Calculated characteristics of the transverse oscillations of particles in the proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 141-152

TEXT: The computations are carried out in a curvilinear orthogonal coordinate system, where the X-axis corresponds with the ideal equilibrium orbit. In this system the element of length is given by

$$ds^2 = \left\{\left[R(x) + r\right] / R(x)\right\}^2 dx^2 + dr^2 + dz^2 \quad (1)$$

where the coordinate r measures the shortest distance from the x-axis to the projection of the point on the plane of the equilibrium orbit, $z = 0$. This distance is taken along the normal to the x-axis. In C-magnets the radius of curvature $R = 30.602$ m, in the X-magnets and spaces between blocks $R = \infty$. The accelerator electromagnet consists of 112 blocks, divided into 14 sections of 8 blocks each. The author considers

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Calculated characteristics ...

successively the manner of numbering the magnetic blocks, the design parameters of the magnetic period, the matrices of the undisturbed magnetic system, the Flocquet function, the periodic orbit of particles with non-equilibrium momentum, the periodic functions connected with the corrective field, the effects of gradient windings and the calculation of the tolerances. The frequencies of oscillation along the r and z axes were assumed to be discontinuous functions, constant along the effective length of a block and equal to zero along the effective length of the spaces between blocks. The effective lengths were calculated taking into account the field gradient obtained from magnetic measurements. The values of the complex Flocquet function required for the calculations are tabulated. The tolerances which are fully tabulated are calculated in the linear and nonlinear approximations. There are 3 figures and 12 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE (Institute of Theoretical and Experimental Physics GKAE)

SUBMITTED: March 16, 1962

Card 2/2

10765
S/120/62/000/004/046/047
E039/E420

24,6730

AUTHORS: Vladimirskiy, V.V., Barabash, L.Z., Pligin, Yu.S., Veselov, M.A., Talyzin, A.N., Taranov, Ye.K., Kuz'min, A.A.

TITLE: Measurement of the frequency of transverse oscillation of the beam of the 7 Gev proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 245-247

TEXT: Periodic oscillations of the centre of gravity of separate bunches in the proton beam are observed with the aid of the signal electrodes used for determining the beam position. The signals are amplified with a wide band amplifier and observed on a double beam oscillograph using photographic recording. At 0.5 m sec after injection transverse oscillations connected with small initial oscillations of the beam at the moment of injection are observed. These transverse oscillations decay rapidly in 2 to 3 msec. The basic measurements were therefore made by artificially exciting oscillations by applying a transverse electric field ε = 1 to 1.5 KV/cm over a length of $\simeq$20 cm for a time of 4 to 10 μ sec. The amplitude of oscillation of the beam in one

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Measurement of the frequency ...

revolution is then $A = 400\ e\ell/pv$ cm where p is the pulse and v is the proton velocity. Immediately after injection the amplitude is about 1 cm and after 100 msec about 0.5 mm. To facilitate analysis the time of injection was limited to about 5 μ sec for a duration of revolution of 9 μ sec and in addition a sinusoidal signal with a frequency of 7/8 the frequency of revolution of the beam is presented on the second trace of the oscillograph. Results are presented showing the frequencies of vertical and radial oscillations which are very near to resonance values: Q_z max = 12.94 and Q_r min $\simeq$ 12.55.
There are 2 figures and 2 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE (Institute of Theoretical and Experimental Physics GKAE)

SUBMITTED: May 18, 1962

Card 2/2

TARASOV, Ye. K.

24680

10766
S/120/62/000/004/047/047
E039/E420

AUTHORS: Vladimirskiy, V.V., Gol'din, L.L., Pligin, Yu.S., Veselov, M.A., Talyzin, A.N., Tarasov, Ye.K., Koshkarev, D.G., Lapitskiy, Yu.Ya., Barabash, L.Z. Kloopov, I.F., Lebedev, P.I., Kuz'min, A.A., Batalin, V.A., Onosovskiy, K.K., Uvarov, V.A., Vodop'yanov, F.A.

TITLE: Adjustment of the acceleration regime of the 7 Gev proton synchrotron

PERIODICAL: Pribory i tekhnika eksperimenta, no.4, 1962, 248-255

TEXT: In order to establish the optimum parameters for programming the control frequency the intensity, position, and frequency and amplitude of transverse oscillation of the beam is measured in three stages: (1) during the first revolution, (2) with a circulating beam and (3) with acceleration. For measurements on the first revolution long afterglow scintillation screens are used which are either observed visually or by means of a television camera. The screens are placed in the sections between magnet blocks; 15 in the initial part and 10 in the final part of the chamber. It is shown that the orbit does not

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Adjustment of the acceleration ...

deviate by more than 1.5 cm from the axis during the first revolution. Circulating beams without acceleration are obtained which continue for 20 to 30 revs. The circulating current is determined by means of a flight tube and the transverse oscillation frequency with an electrostatic probe with double vertical and horizontal plates. Scintillation screens in the form of a grid with 85% transmission are used to show the beam position and diameter for 5 to 10 revs. The beam diameter is shown to be about 4 cm under normal conditions. Investigations are carried out on the optimum form of the frequency - time relation for holding the beam in orbit. The width of the trapping region is $\pm$ 3 Kc/s for an initial frequency of 750 Kc/s which agrees well with theoretical estimates. Preliminary adjustment permitted the attainment of 6.2 Gev protons and after adjustment 7.2 Gev protons were obtained on October 25, 1961. The usual intensity on a normal cycle lies in the range 3 to 5 x 10^9.
There are 7 figures and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki GKAE (Institute of Theoretical and Experimental Physics GKAE)

SUBMITTED: April 11, 1962

Card 2/2

TARASOV, YE. K.

S/089/62/012/006/003/019
B102/B104

24,6730

AUTHORS: Vladimirskiy, V. V., Komar, Ye. G., Mints, A. L., Gol'din, L. L., Monoszon, N. A., Rubchinskiy, S. M., Tarasov, Ye. K., Vasil'yev, A. A., Vodop'yanov, F. A., Koshkarev, D. G., Kuryshev, V. S., Malyshev, I. F., Stolov, A. M., Strel'tsov, N. S., Yakovlev, B. M.

TITLE: The design of the 7-Bev proton synchrotron

PERIODICAL: Atomnaya energiya, v. 12, no. 6, 1962, 472-474

TEXT: The history of the first Soviet cyclic accelerator with rigid focusing is briefly described, and the most important data on its planning and operation are presented. Planning was started in 1953. The parameters of this proton accelerator, the energy of which exceeds the antinucleon production threshold, were so chosen that the dependence of the orbital circumference on the particle momenta was completely compensated. This was achieved by employing 14 quadrupole magnets with orbits of negative curvature. Technical data: output current, 10^{10} protons/pulse; maximum field strength, 8475 oe; length of equilibrium orbit, 251.2 m; radius of

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The design of the 7-Bev ...

curvature of the trajectories in the bending magnets (C), 31 m, and in the compensation magnets (X), ∞; number of magnetic sectors, 98C + 14X; gap length between the C-magnets, 304.0 mm; gap length around the X-magnets, 417.5 mm; index of the decrease in field strength, 460; internal height and width of the chamber, 80 and 110 mm, respectively; number of betatron oscillations per revolution, 12.75, and per periodic element, 0.91; number of magnets per periodic element, 8; total critical energy, 19.2 Bev; maximum deviation of the periodic orbit with 100% deviation of the momentum from the equilibrium momentum, 1.47 m; rate of energy increase per revolution, 4.3 kev; duration of one cycle, 1.55 sec; 10-12 cycles/min; particle revolution frequency at the beginning of the cycle, 0.11 Mc/sec, and at the end, 1.19 Mc/sec; frequency of synchrocyclotron oscillations, 3600 and 130 cps; weight of the electromagnet steel, 2500 tons; maximum power of the supply system, 25 Mw; Van de Graaff injector (particle energy, 3.8 Mev; field strength 90 oe); admissible deviations from field strength and field gradients, $\sim 10^{-3}$; deviations at the chamber edge due to nonlinearities, $\sim 10^{-2}$; admissible frequency deviation of the accelerating field at the beginning of the cycle, 10^{-3}, and at the end, $5 \cdot 10^{-5}$. There are 1 figure and 1 table.

SUBMITTED: March 12, 1962
Card 2/2

L 43088-65 EWT(m)/ EPA(w)-2/EWA(m)-2 Pab-10/Pt-7 IJP(c) JT/GS

ACCESSION NR: AT5007918 S/0000/64/000/000/0197/0201

AUTHOR: Vladimirskiy, V. V.; Gol'din, L. L.; Koshkarev, D. G.; Tarasov, Ye. K.; Yakovlev, B. M.; Gustov, G. K.; Komar, Ye. G.; Kulikov, V. V.; Malyshev, I. F.; Monoszon, N. A.; Popkovich, A. V.; Stolov, A. M.; Strel'tsov, N. S.; Titov, V. A.; Vodop'yanov, F. A.; Kuz'min, A. A.; Kuz'min, V. F.; Mints, A. L.; Rubchinskiy, S. M.; Uvarov, V. A.; Zhadanov, V. M.; Filaretov, S. G.; Shiryayev, F. Z.

TITLE: 60-70 Gev Proton Synchrotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 197-201

TOPIC TAGS: high energy accelerator, synchrotron

ABSTRACT: A 60-70 Gev proton synchrotron with strong focusing is being constructed not far from Serpukhov, as has been reported earlier (e.g. "Research Institute for Electro-Physical Equipment, Leningrad," in Proceedings of the International Conference on High Energy Accelerators and Instrumentation (CERN, 1959), p. 373). The present report describes parameter changes and improvements in precision structural characteristics of the accelerator, and the present state of construction in mid-1963. The parameters of the magnet are presented in a table. A small change in the original plans permitted an increase in the length of a part of the free

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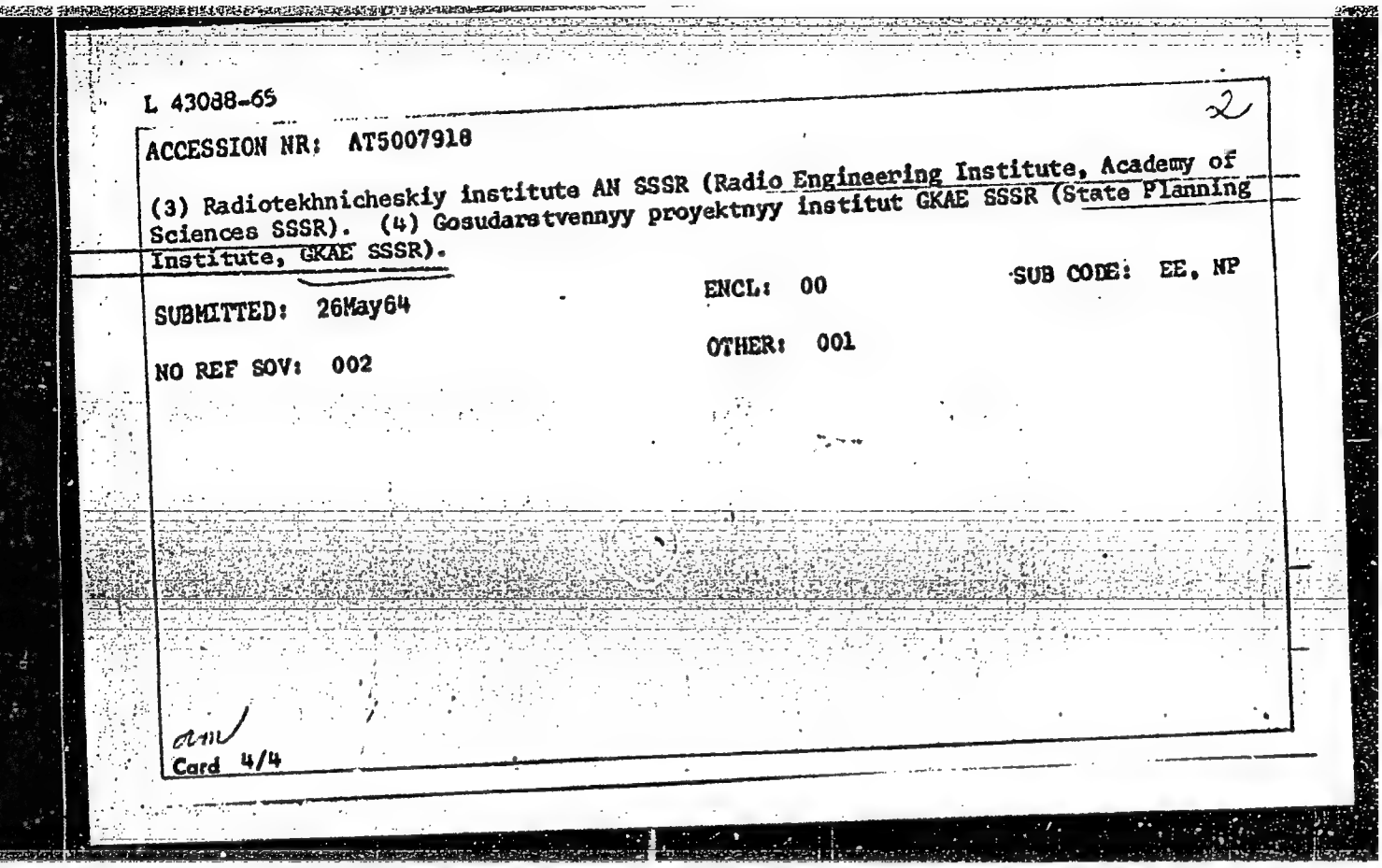
ACCESSION NR: AT5007918

sections, some of which are utilized for input and exit of beams. The super-period design is described. The lengthened sections were obtained as a consequence of shortening the focusing and defocusing blocks by 112 cm. The focusing properties of the magnetic channel were diminished consequently, but very little; and the limiting energy was lowered by 2-3 Gev. The construction of the magnet is described. Each of the magnetic blocks is divided lengthwise into 5 sub-blocks which are enveloped by the common winding. These sub-blocks consist of laminar two-millimeter silicon steel. These steel sheets were stamped out without subsequent mechanical working, and were subjected to sorting and intermixing in order to smooth out their magnetic characteristics. The sub-blocks are constricted by lateral welded plates without adhesion. Provision was made for windings on the poles in order to correct for pole nonlinearity and for variations in the drop reading. These windings make it possible to introduce artificial quadratic (square) nonlinearity that changes the dependence of the frequency of transverse oscillations during a pulse. In order to correct for straying of the residual field, provision has been made for windings on the yoke in series with the main winding. The sub-blocks must undergo calibration on a magnet stand in order to make correcting systems more precise and to determine the most convenient disposition of the sub-blocks along the ring. The winding of the electromagnet is made of aluminum busbars with hollow cores for cooling water. The length of the busbar is so selected that there would be no

ACCESSION NR: AT5007918

welded joints inside the coils. The winding consists of 4 sections, two of which are disposed on the upper pole and two on the lower. The most important characteristics of the electromagnet and power supply system are described in a table. Also described are the vacuum chamber and accelerating field (obtained by 53 paired resonators with ferrite rings, which operate at the 30-th harmonic of revolution and give accelerating potential of 350 kilovolts). The ring tunnel and the general arrangement of the accelerator are shown in figures and described. The building for the injector and portions of the ring tunnel from the injector to the experimental room have been completed in the main and are ready for installation of equipment. This room, in the form of a single-aisle building without internal supports, permits one to work on beams brought into the inner and outer sides. A 90-meter arch covers this room, whose overall length is 150 meters. Provisions have been made for a second experimental room at the southwest part of the ring. Orig. has 4 figures, 2 tables.

ASSOCIATION: Institute teoreticheskoy i eksperimental'noy fiziki GKAE SSSR (Institute of Theoretical and Experimental Physics, GKAE SSSR). (2) Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury imeni D. V. Yefremova GKAE SSSR (Scientific Research Institute of Electrophysical Apparatus, GKAE SSSR).



L 43088-65

ACCESSION NR: AT5007918

(3) Radiotekhnicheskiy institute AN SSSR (Radio Engineering Institute, Academy of Sciences SSSR). (4) Gosudarstvennyy proyektnyy institut GKAE SSSR (State Planning Institute, GKAE SSSR).

SUBMITTED: 26May64 ENCL: 00 SUB CODE: EE, NP

NO REF SOV: 002 OTHER: 001

Card 4/4

TARASOV, Ye.M.; GORBESHKO, R.P.

Selection of the composition of mortars using local nonstandard fillers for the cities of the provinces of Turkmenistan. Trudy Inst. antiseism. stroi. AN Turk. SSR. no.2:55-65 '58.

Behavior of masonry mortars with active finely-milled additives and of masonry in the dry and hot climate of Turkmenistan. Trudy Inst. antiseism. stroi. AN Turk. SSR no.2:79-89 '58. (MIRA 17:6)

TARASOV, Yevgeniy Petrovich

[Nikolai Il'ich Podvoiskii; a sketch of his military activities] Nikolai Il'ich Podvoiskii; ocherk voennoi deiatel'nosti. Moskva, Voenizdat, 1964. 175 p. (MIRA 18:3)

SOV/147-58-1-7/22

AUTHOR: Tarasov, Ye.V.

TITLE: On the Problem of the Maximum Range of a Flying Machine Equipped with a Ram Jet (K voprosu o maksimal'noy dal'nosti poleta letatel'nogo apparata s SPVRD)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya Tekhnika, 1958, Nr 1, pp 53 - 60 (USSR)

ABSTRACT: Analytical and graphical methods of calculating the maximum range are usually based on the assumptions that the thrust of the motor is constant and that the coefficient of external drag is also constant, or in some cases is taken to vary only with the velocity of flight. Such assumptions are to a certain degree valid for rockets with solid or liquid fuel motors. It is of interest to derive an analytic method of calculating the trajectory, the variation in thrust and the fuel consumption in the combustion chamber to ensure maximum range of the machine with an air-breathing jet motor. In this paper, such a method is proposed for the powered part of the flight of a flying machine with a ram jet. It is required that the useful load is ejected at a maximum distance for given initial weight of the rocket, given fuel supply and initial values of angle of launching θ_1, altitude H_1 and M_1 (undefined in text). The relation of the thrust and the

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SOV/147-58-1-7/22

On the Problem of the Maximum Range of a Flying Machine Equipped with a Ram Jet

coefficient of external resistance to the velocity and altitude in a real atmosphere are calculated and in connection with a supersonic speed the compressibility of the atmosphere is taken into account. The method described makes it possible to calculate the moment at which the motor ceases to function, the required quantity of fuel, its law of consumption in the combustion chamber and the initial values θ_1, M_1 and H_1 such as to ensure maximum range for a known useful load and structural weight. If there is known a relation between the velocity and altitude at the beginning of gliding flight and the angle made by the tangent to the trajectory with a local horizon, motion takes place in the vertical plane and the thrust is directed along the tangent to the trajectory: during powered flight the curvature of the Earth is ignored. The method of variational calculus is used.

ASSOCIATION: Moskovskiy aviatsionnyy institut (Moscow Aviation Inst.)
SUBMITTED: November 14, 1957
Card 2/2 1. Aircraft--Range 2. Ramjet engines--Applications 3. Mathematics --Applications

SOV/147-58-4-10/15

AUTHORS: Kvasnikov, L. A., Tarasov, Ye. V. and Shakhurin, S. I.

TITLE: Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases (Forsirovaniye kamer sgoraniya gazoturbinnykh dvigateley po temperature gaza)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Aviatsionnaya tekhnika, 1958, Nr 4, pp 81-91 (USSR)

ABSTRACT: Alongside the major research problem pertinent to further development of the turbojet engine for use on aircraft flying at speeds substantially higher than the speed of sound by improvements of the compressor, diffusor and the nozzle, there exists also the smaller problem of a possible improvement of its performance by simply increasing the temperature of the gases at the exit from the combustion chamber (T_3). This, in turn, poses the problem of developing a combustor (and the turbine) capable of a stable operation over a large range of fuel-air conditions and at the same time maintaining a good efficiency of combustion throughout the range (and especially when rich mixtures are used). The object of this investigation was to analyze the possibility of

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Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

increasing the temperature T_3 up to 1400°K. Two independent parameters which affect the working process of the combustion chamber were investigated, viz: the admission of air along the axis of the combustor and the depth of penetration of the secondary air supply into the primary air stream. Experiments were carried out on three combustors: two variants with different air distribution and the fundamental, low temperature, combustor (which was a single burner flame tube of a serial production engine with the annular combustion chamber having the temperature of the exit gases of 1200°K). The second variant had a greater mass flow of the air in the forward zone of the combustor compared with the first variant. The working process in the combustor was assessed by measuring distribution of the temperature, velocity, concentration of the fuel, and the turbulence across several sections along the axis of the combustor. Boosting of the combustion chamber by increasing only the

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Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

supply of fuel upsets the concentration at the flame front and leads to a poorer combustion and a longer flame tongue. Therefore, it is necessary also to increase the supply of air into the main part of the combustion chamber. With a constant air intake this means a redistribution of the air supply along the combustion chamber. Fig 1 shows the redistribution adopted in the experiments: full line represents the basic variant, dotted line - variant Nr 3. The experimental points were obtained by blowing the air through the combustion chamber (the coordinates give the relative values: mass flow of air: Gi/G_{total} and the position of the inlet holes for the secondary air: $\ell i/L_{total}$ of com.chamber). The redistribution from the mixing zone into the combustion zone was arranged so that the mean coefficient of the excess of air at the end of the combustion zone (α) in both variants was the same (see Fig 2). Applying the method developed at the Chair of Aircraft Engines of the Moscow Aviation Institute, it is possible to determine

Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

approximately the layout of the flame tongue, so that choosing now the position of the radial openings in the liner for the secondary air supply, the problem of its penetration depth can be examined. Fig 3 shows the axial distribution of this penetration which was used in computations. The empirical formula for the depth of penetration of the secondary air flow is given on p 84, where: w_c is the inlet velocity (depending upon the pressure gradient, diameter of the holes and the stream velocity w_{CH}). As shown in Fig 4 pressure drop Δp does not remain constant along the axis of the combustor. In the annulus, the pressure of the secondary air increases slightly due to velocity drop, while in the flame tube pressure decreases on account of speed increase due to high temperatures and increased discharge. Hence, there appears to be a controlling section which will decide pressure distribution in the flame tube (in Fig 4 this is the station Nr 9). Varying now the number of holes and their diameter, the air flow-pressure

Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

along the combustor will be changed, and it is possible for the pressure inside the flame tube to be higher than outside in the secondary air stream so that the air will escape from the flame tube into the outer jacket (Fig 4). Having completed preliminary experiments on six different types of the flame tube, eventually only two variants were retained for further investigations, viz. the variant Nr 2 with 7 holes and the variant Nr 3 with 16 holes. The results of these investigations are given in Figs 5 to 10. Fig 5 shows the effect of the overall air excess coefficient α_{ob} on the coefficient of fullness of the combustion process. It is seen that combustion is improved in the variants 2 and 3 by the redistribution of the secondary air supply. This is even more obvious from Fig 6 where the temperature distribution is shown. Variant Nr 2 with a deeper penetration (at the same $\alpha_{overall} = 4.6$) by the secondary air than that of the variant Nr 3, produces higher temperatures in the first half of the combustor. As the mixture grows richer ($\alpha_{overall} = 3.2$) both variants produce about the same

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Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

temperatures (i.e. the same degree of combustion) as shown in Fig 7. With a lean mixture ($\alpha_{overall} = 9$) - variant Nr 2 though still possessing a deeper penetration of the secondary air flow than that of the variant Nr 3, has a poorer degree of combustion. Fig 8 shows temperature distribution at the exit from the combustion chamber (dotted lines) for the variant Nr 3 at $\alpha_{overall} = 4.6$ and the inset shows the positions of the thermocouples. It is seen that the temperature falls with height. This temperature gradient affects adversely the strength of the turbine blades. By varying the number and diameter of the holes in the last two stations so that their total area remained unchanged, this temperature distribution was altered to that shown by the full line in Fig 8. Fig 9 shows the coefficient of turbulence $\varepsilon = (w'/w)$ (w' = pulsating component of the velocity w = stream velocity) across several sections in the basic combustor (full line) and variant Nr 3

Boosting the Combustor of Gas Turbine Engines by Increasing the Temperature of the Combustion Gases

(dotted line), while Fig 10 shows the variation of this coefficient along the axis of the flame tube.
There are 10 figures and 1 Soviet reference.

ASSOCIATION: Kafedra AD-1 (Chair AD-1), Moskovskiy aviatsionnyy institut (Moscow Institute of Aeronautical Engineering)

SUBMITTED: March 31, 1958

Card 7/7

20596

S/147/61/000/001/005/016
E022/E135

26.3110
AUTHOR: Tarasov, Ye.V.

TITLE: Optimal Thrust Programming of the Propulsive Units for a Given Trajectory of the Flight

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1961, No. 1, pp. 38-45

TEXT: The article deals with the problem of determining the optimal thrust of a propulsive unit needed to secure a particular requirement of the vehicle flight (e.g. the range, the initial weight, etc.), when the trajectory is prescribed. Various propulsive systems are considered. The present work forms thus a complementary study to various others (Refs. 2-5) in which program control for a vertical or horizontal trajectory is considered. In order to make the analysis applicable to all possible cases, the following assumptions are made. 1) Only the motion of the centre of gravity is considered and it is taken to be a uni-planar motion. 2) For the powered portion of the trajectory the earth surface is flat (i.e. the gravitational field is assumed parallel). 3) The aerodynamic forces (lift and drag) are those of a steady

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S/147/61/000/001/005/016
E022/E135

Optimal Thrust Programming of the Propulsive Units for a Given Trajectory of the Flight

flight. 4) No atmospheric turbulence is admitted. The analysis is carried out using natural coordinates, i.e. normal and tangential to the trajectory of the vehicle. The parameters, influencing or defining the path, are assumed to be continuous and to be differentiable. These parameters are: V - velocity; h - altitude; ℓ - horizontal distances; G - weight; P - thrust; θ - inclination of the path to the horizontal; t - time. Since the magnitude of the thrust P is in effect limited between certain P_{min} and P_{max} where both limiting values are constant, the thrust curve is considered as sectionally continuous and dependent on some additional parameter r (of no physical interpretation) which varies from $-\infty$ to $+\infty$. Such a representation gives $\partial P/\partial r = 0$ when $P = P_{min}$ or P_{max}, and $\partial P/\partial r \neq 0$ denotes the effective range of the propulsive unit. To solve the problem the calculus of variation is used, with Lagrange multiples and Eulers equations. The general equations

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S/147/61/000/001/005/016
E022/E135

Optimal Thrust Programming of the Propulsive Units for a Given Trajectory of the Flight

developed are then used to consider an example when the flight time is not limited. It is shown in this example that the results agree with those of O.Ye. Okhotsimskiy (Ref.2), G. Leitman (Ref.4) and Tsyan and Evans (Ref.5). For horizontal flight the final equation is the same as that obtained by A. Miele (Ref.3).
There are 5 Soviet references.

ASSOCIATION: Moskovskiy aviatsionnyy institut, Kafedra 201 (Department 201, Moscow Aviation Institute)

SUBMITTED: September 24, 1960

Card 3/3

SOV/6572

PHASE I BOOK EXPLOITATION

Tarasov, Yevgeniy Vasil'yevich

Optimal'nyye rezhimy poleta letatel'nykh apparatov (Optimal Flight Conditions for Aerospace Vehicles) Moscow, Oborongiz, 1963. 247 p. 3500 copies printed.

Reviewer: G. V. Kamenkov, Doctor of Physical and Mathematical Sciences, Professor; Ed. of Publishing House: N. A. Gortsuyeva; Tech. Ed.: N. N. Skotnikova; Managing Ed.: S. D. Krasil'nikov, Engineer.

PURPOSE: This book is intended for scientific and technical personnel of design bureaus and scientific research institutes and for teachers and senior students of aviation schools of higher education.

COVERAGE: This work is concerned with the search for and theoretical investigation of optimal conditions of flight of airplanes and space vehicles, taking into account static and dynamic characteristics of different propulsion systems in conjunction with problems of vehicle and propulsion system design, and using the variational method. A series of particular problems as optimum thrust programming for a given flight trajectory and

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Optimal Flight Conditions (Cont.)

optimal flight conditions of a space vehicle in space with different gravitational fields are analyzed. No personalities are mentioned. There are 116 references: 29 Soviet and 87 non-Soviet.

TABLE OF CONTENTS:

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TARASOV, Ye.V.

Optimum motion conditions for flying craft. Izv.vys.ucheb.zav.; av.tekh. 6 no.3:34-42 '63. (MIRA 16:10)

TARASOV, Yu., inzhener-podpolkovnik

Near the ceiling. Av. i kosm. 47 no.7:68-74 Jl '65. (MIRA 18:6)

TARASOV, Yu., kand.-podpolkovnik

From the drawing to the flight. Av. i kosm. 48 no.3:38-43 Mr '65. (MIRA 18:7)

C-3

Category : USSR/Nuclear Physics - Elementary Particles

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 444

Author : Tarasov, Yu.A.
Inst : Moscow State University, Moscow, USSR
Title : On the Interaction Between the Nucleon and the Anti-Nucleon

Orig Pub : Zh. eksperim. i teor. fiziki, 1956, 30, No 3, 603-605

Abstract : Using the "old" Tamm method, an equation is obtained for the nucleon-anti-nucleon system. The resulting equation differs from the corresponding nucleon-nucleon equations in having an opposite sign for the "non-interchangeable" part owing its origin to the annihilation in the intermediate state.

Card : 1/1

TARASOV, YU. A.

56-3-23/59

AUTHOR: Tarasov, Yu.A.

TITLE: On Bound States in Positronium (K voprosu o svyazannykh sostoyaniyakh pozitroniya)

PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol. 33, Nr 3, pp. 706-709 (USSR)

ABSTRACT: The author proves theoretically that the "bound" states of the electron and positron - generally of a Fermion and an Antifermion - can be investigated by means of an analysis of the poles of the photon distribution function. This treatment does not contradict Lehman's theory. At the time being the "bound" states of a nucleon and of an antinucleon are investigated by means of the same method. There is 1 Slavic reference.

ASSOCIATION: Moscow State University (Moskovskiy gosudarstvennyy universitet)

SUBMITTED: March 7, 1957.

AVAILABLE: Library of Congress

Card 1/1

TARASOV, Yu. A. Cand Phys-Math Sci -- (diss) "On the problem of related bound states of thermion and anti-thermion." Mos,1958. 7 pp. (Mos State Univ im M.V. Lomonosov. Phys Faculty). 100 copies. (KL, 8-58,103)

TARASOV, Yu.A.

Problem of the bound state of fermion and antifermion in the quantum field theory. Nauch. dokl. vys. skoly; fiz.-mat. nauki no.1:84-88 '58. (MIRA 12:3)

1.Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova. (Field theory) (Particles, Elementary)

16.7800, 16.8100, 16.8300

76986
SOV/56-37-6-26/55

AUTHOR: Tarasov, Yu. A.

TITLE: Stability of a Plane Poiseuille Flow of a Finite Conductivity Plasma in a Magnetic Field

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 6, pp 1708-1713 (USSR)

ABSTRACT: Equations were derived describing the flow stability of a longitudinal plasma in a magnetic field with respect to infinitely small perturbations in the case of Reynolds number $R_m \lesssim 1$. A set of neutral curves was obtained for values I, II, III, IV, and V (on the plot, Fig. 1).

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Stability of a Plane Poiseuille Flow of a Finite Conductivity Plasma in a Magnetic Field

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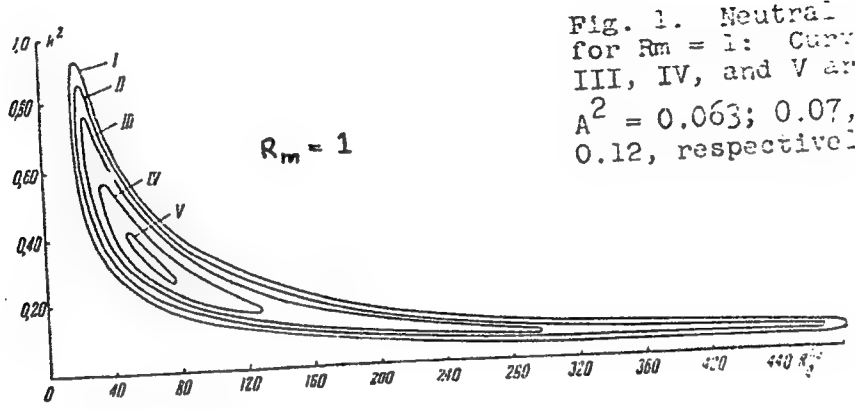

Fig. 1. Neutral curves for Rm = 1: Curves I, II, III, IV, and V are for A^2 = 0.063; 0.07, 0.08; 0.11, 0.12, respectively

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Stability of a Plane Poiseuille Flow of a Finite Conductivity Plasma in a Magnetic Field

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At $R_m = 3$, $A_{critical} \approx 0.17$ and at $R_m = \infty$, $A_{critical} = 0.1$. Thus, if the velocity of the flow $U_c = 10^5$ cm/sec and density $\rho = 10^{-3}$ g/cm^3, then the intensity of the critical magnetic field, $H_{critical}$, required for the stabilization of the flow with an ideal conduction, should be $\sim$1000 G; and at $R_m = 3$, $H_{critical} \sim 1850$ G. The mechanism of the expansion and extinction of the perturbations is analogous to the usual hydrodynamic mechanism. There are 2 graphs; and 3 references, 2 Soviet, 1 U.K. The U.K. reference is: J. T. Stuart. Proc. Roy. Soc. A221, 1145, 1954.

SUBMITTED: July 4, 1959

Card 3/3

S/040/60/024/04/14/023
C 111/ C 333

AUTHORS: Pavlov, K. B., Tarasov, Yu. A. (Moscow)

TITLE: On the Stability of the Flow of a Viscous Conducting liquid Between Parallel Planes in a Vertical Magnetic Field

PERIODICAL: Prikladnaya matematika i mekhanika, 1960, Vol. 24, No. 4, pp. 723-725

TEXT: The parabolic distribution of the velocities in a flow between two parallel walls changes under the occurrence of a magnetic field normal to the velocity of flow such that for large Hartmann numbers the variation of the velocity profile takes place only in a thin wall layer. The authors investigate the stability of such a flow relative to infinitesimal disturbances under the assumption that the magnetic Reynold number is $R_m \sim 1$, so that the range of high velocities and of temperatures from 5000° to 10 000° is included. From the linearized equations of magnetic hydrodynamics the authors obtain a system of two equations for the perturbations of the velocity of flow and of the field. By applying the asymptotic methods from (Ref.6) then the authors succeed in extending the results of Lock (Ref. 5) for the case $R_m \ll 1$ to the

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S/040/60/024/04/14/023
C 111/ C 333

On the Stability of the Flow of a Viscous Conducting Liquid Between Parallel Planes in a Vertical Magnetic Field

/B

case $R_m^4 \leq Rg$, where R_g is the ordinary Reynold number.

The authors thank K. P. Stanyukovich for discussion.

There are 1 figure, and 6 references: 3 Soviet, 2 English and 1 American.

SUBMITTED: March 16, 1960

Card 2/2

41140
S/056/62/043/004/048/061
B104/B186

AUTHORS: Kudrin, L. P., Tarasov, Yu. A.

TITLE: The energy level shifts and the equation of state of a plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 43, no. 4(10), 1962, 1504-1516

TEXT: The first part deals with studies on the level shifts of bound states of one-electron atoms in a plasma, using the four-dimensional perturbation theory based on the equations derived by Salpeter-Bethe. A system of Coulomb particles is investigated in the volume V under thermodynamic equilibrium conditions at $T = 1/\beta$. The interaction energy of a system comprising one ion with the charge z and one electron is assumed to be sufficiently small to permit of using the perturbation theory in order to investigate the Green two-particle function which determines the levels of the discrete spectrum. For the level shifts of the S-states of single-electron atoms in a plasma one obtains

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The energy level shifts and ...

$$\Delta E_{n0} = \begin{cases} -\frac{5}{4}\left(\frac{z-1}{z}\right)^2 \frac{a_0 \varkappa}{\beta} & \text{при } n = 1 \\ -\frac{3}{2}\left(\frac{z-1}{z}\right)^2 \frac{a_0 \varkappa}{\beta} n^2 & \text{при } n = 2, 3, 4 \ldots \end{cases}, \qquad (25),$$

whereas

$$\Delta E_{20} = -6\left(\frac{z-1}{z}\right)^2 \frac{a_0 \varkappa}{\beta}, \quad \Delta E_{21} = -\frac{14}{3}\left(\frac{z-1}{z}\right)^2 \frac{a_0 \varkappa}{\beta}. \qquad (25')$$

holds for $n = 2, l \neq 0$. Conclusions: If kT/E_n is small, the level shifts are proportional to the square root of the density, increasing with $\sqrt{T}$. The level shift also increases with increasing principal quantum number. The second part is a study on the equation of state of a Debye plasma. The statistical sum of a system consisting of particles which exhibit short-range forces is given by $Z = Sp \exp(-\beta(H - \mu N)) = \exp(-\beta\Omega)$, where μ is the chemical potential, Ω is the thermodynamic potential and N is the total number of particles involved in the system. Ω can be expressed in terms of Green's two-particle function in the form $\Omega = \Omega_0 + \Delta\Omega$.

In the case of Boltzmann statistics, one obtains

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The energy level shifts and ...

$$\Delta\Omega = \frac{e^{2\mu\beta}}{(2\pi)^3}\left(\frac{m}{\pi\beta}\right)^{3/2}\int_0^{e^2}\frac{de'}{e'}\int dp\sum_k e^{-\beta E_k}\left(E_k - \frac{p^2}{m}\right)\psi_k(p)\psi_k^*(p). \qquad (40).$$

This equation is analogous to the known equation derived by Bethe and Uhlenbeck for the second virial coefficient when quanta are concerned.

$$\Delta\Omega = \frac{e^{2\mu\beta}}{16}\left(\frac{m}{\pi\beta}\right)^3\int_0^1\frac{d\lambda}{\lambda}\int_0^\infty 4\pi r^2\lambda U(r)e^{-\beta\lambda U(r)}dr = \qquad (41)$$

$$= -\frac{n^2}{2\beta}\int_0^\infty (e^{-\beta U} - 1)\,4\pi r^2 dr, \qquad n = e^{\beta\mu}(m^3/\hbar(2\pi\beta)^{3/2}.$$

holds for the quasiclassical limiting case, whereas

$$\Delta\Omega = \frac{e^{2\mu\beta}}{(2\pi)^3}\left(\frac{m}{\pi\beta}\right)^{3/2}\int_0^{e^2}\frac{de^2}{e^2}\int dp\,dp' U(p-p')\sum_k e^{-\beta E_k}\psi_k(p')\psi_k(p), \qquad (42)$$

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S/056/62/043/004/048/061
B104/B186

The energy level shifts and ...

is obtained for a system involving particles with Coulomb interaction and

$$\beta\Delta\Omega = 2\pi n^2 (e^2\beta)^3 \int_0^1 \lambda^2 d\lambda \int_0^\infty t dt \,(\exp(t^{-1}e^{-\alpha t}) - 1), \qquad (43)$$

for the quasiclassical limiting case, where $\psi_{1k}(\vec{r})$ are wave functions for a Debye potential possessing the charges $e\sqrt{\lambda}$, $0 \leq \lambda \leq 1$, and $\alpha = \beta e^2 \varkappa \lambda^{3/2} \ll 1$. In the case of ee, ii, ie, aa and ia interactions, these results are modified for a plasma which is characteristic for the existence of free electrons, ions possessing the charge z(i) and atoms ionized by a factor of (z-1). Starting from

$$\Delta\Omega = \frac{1}{(2\pi)^6\beta} \int_0^{e^2} \frac{de^2}{e^3} \int \varphi(p_1, g)\, \Gamma(p_1, p_1, g)\, dp_1 dg,$$

$$\Gamma(p, p', g) = (2\pi)^3 \beta U(p - p') + \frac{1}{(2\pi)^3\beta} \int V(p - p_1)\varphi(p_1, g)\, \Gamma(p_1, p', g) dp_1 \qquad (50)\text{-}(51),$$

Card 4/5

The energy level shifts and ...

a thermodynamic perturbation theory is developed which yields

$$\Delta\Omega = \frac{1}{(2\pi)^6\beta}\int_0^{e^2}\frac{de^2}{e^2}\int dp\,dp_1\,dg\exp\{\beta(\mu_e+\mu_i-\varepsilon_g)\}\times$$
$$\times\sum_{n,k}'\psi_n(p)\psi_k(p)(E_k'-\varepsilon_{p_1})\psi_n^*(p_1)\psi_k(p_1)\left\{\frac{(E_k'-\varepsilon_p)\exp(-\beta E_k')}{(E_k'-\varepsilon_{p_1})^2}-\right.$$
$$\left.-\frac{(E_n'-\varepsilon_p)\exp(-\beta E_n')}{(E_n'-\varepsilon_{p_1})^2}\right\}. \qquad (56).$$

It is shown that the terms in thermodynamic functions due to level shifts are greater than the corrections for the Debye term, if the number of "atoms" equals that of the electrons. There are 2 figures.

SUBMITTED: May 7, 1962

Card 5/5

ACCESSION NR: AP4038430 S/0294/64/002/002/0160/0169

AUTHORS: Abramov, V. A. (Moscow); Tarasov, Yu. A. (Moscow)

TITLE: Emission of a cesium plasma

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 2, 1964, 160-169

TOPIC TAGS: cesium plasma, plasma instability, magnetohydrodynamics, magnetohydrodynamic generator, ionization, recombination phenomena, emission spectrum

ABSTRACT: In view of the importance of cesium as an additive to the working gas of a magnetohydrodynamic generator, the line and continuous emissions of a cesium plasma are analyzed in the temperature range 3,000--4,000K. The analysis is simplified by regarding the system as having two levels, by assuming the plasma to be optically thin, and by neglecting effects of ionization with recombination. The deviations from the Boltzmann law are evaluated. Allowance for

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ACCESSION NR: AP4038430

the quasistatic action of the ions is shown to increase the intensity of a given line by about 18%. The total energy yield due to the line radiation is determined for different densities and temperatures. The energy of the recombination radiation and the cross sections for radiative recombination of the Cs atoms are evaluated for several levels. It is shown that the recombination radiation produces a much lower energy flux than the line emission. This agrees with the results for a hydrogen plasma obtained by L. M. Biberman et al. (Optika i spektroskopiya v. 14, 330, 1963). "In conclusion the authors are grateful to Ye. P. Velikhov, V. I. Kogan, and G. V. Sholin for numerous discussions and also to L. M. Biberman for many valuable remarks. Orig. art. has: 20 formulas and 5 tables.

ASSOCIATION: None

SUBMITTED: 04Nov63 DATE ACQ: 09Jun64 ENCL: 02

Card 2/5

L 20680-65 EEC(b)-2/EPA(w)-2/EWA(c)-2 IJP(c)/SSD(c)/AFWL/SSD/AEDC(a)/SSD(c)/
EWA(m)-2 Pi-4/Pc-4/Pz-6/Pab-10
AEDC(a)/ASD(a)-5/BSD/ASD(f)-3/ASD(p)-3/AFETR/RAEM(a)/RAEM(c)/ESD(gs)/ESD(t)/
AS(mp)-2 AT
ACCESSION NR: AP4042456 S/0294/64/002/003/0313/0320

AUTHOR: Abramov, V. A. (Moscow); Tarasov, Yu. A. (Moscow) B

TITLE: Properties of argon-cesium plasma in an electric field

SOURCE: Teplofizika vy*sokikh temperatur, v. 2, no. 3, 1964, 313-320

TOPIC TAGS: plasma heating, magnetohydrodynamics, plasma conductivity, argon plasma, cesium plasma, electron temperature, MHD generator

ABSTRACT: To determine the efficiency gain that would result from increasing the conductivity of a magnetohydrodynamic-generator plasma stream above its equilibrium value (with the aid of an electric field), the authors estimate the electric field necessary to heat electrons in an argon-cesium plasma to 300--400K. The energy lost in elastic collisions by the cesium ions and atoms and by the argon atoms, as well as the energy lost by inelastic collisions, is taken into account. Some of the losses, such as radiation losses, that

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ACCESSION NR: AP4042456

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must be included in the energy balance were evaluated by the authors elsewhere (Teplofizika vy*sokikh temperatur, v. 2, No. 2, 1964). The values of the optimal plasma conductivity are obtained for different cesium concentrations and argon pressures in the electron temperature range 3000--4000K. Some possible causes of plasma instability are mentioned. "In conclusion the authors are grateful to Ye. P. Velikhov, V. I. Kogan, and G. V. Sholin for numerous useful discussions." Orig. art. has: 3 figures, 7 formulas, and 2 tables.

ASSOCIATION: None

SUBMITTED: 05Jul63 ENCL: 03

SUB CODE: ME NO REF SOV: 002 OTHER: 004

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L 13632-65 EWT(1)/EWG(k)/EPA(sp)-2/EPA(w)-2/EEC(t)/T/EEC(b)-2/EWA(m)-2
Pi-4/Po-4/Pz-6/Pab-10 IJP(c)/AFWL/BSD/ESD(gs) AT
ACCESSION NR: AP4047171 S/0051/64/017/004/0489/0498

AUTHORS: Kudrin, L. P.; Tarasov, Yu. A.

B 21

TITLE: On the width of spectral lines of atoms and ions in a plasma

SOURCE: Optika i spektroskopiya, v. 17, no. 4, 1964, 489-498

TOPIC TAGS: spectrum line, line broadening, plasma ion, plasma electron

ABSTRACT: The Green's function method is employed to calculate the width of spectral lines with allowance for the charged-particle correlation, with an aim at a possible comparison of the calculated and experimental line contours to obtain data on various plasma parameters (such as density or temperature). The advantage of the method lies in the possibility of summing an infinite number of significant terms whose contribution must be included because of the presence of long-range Coulomb forces. The calculations, used in conjunction

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ACCESSION NR: AP4047171

with suitable Feynman diagrams, yield the probabilities of nonradiative transitions of the plasma ions and electrons, from which the broadening of the ion and electron spectral lines are obtained. In the case when the distance between levels is small compared with kT, a formula can be obtained for the impact broadening, in which the logarithmic term is determined exactly and depends on the Langmuir frequency. "The authors thank A. I. Larkin for a discussion." Orig. art. has: 43 formulas.

ASSOCIATION: None

SUBMITTED: 26Oct63 ENCL: 00

SUB CODE: OP, ME NR REF SOV: 004 OTHER: 004

Card 2/2

L 8797-66 EWT(d)/EWP(1) IJP(c) GG/BB

ACC NR: AP5026965 SOURCE CODE: UR/0103/65/026/010/1818/1823

AUTHOR: Petrov, B.K. (Leningrad); Smolov, V.B.; Tarasov, Yu. A.; Ugryumov, Ye. P. (Leningrad)

ORG: None

TITLE: A precision transistorized pulse-time multiplication and division unit

SOURCE: Avtomatika i telemekhanika, v. 26, no. 10, 1965, 1818-1823

TOPIC TAGS: computer component, arithmetic unit, computer circuit, analog system, transistorized circuit

ABSTRACT: The authors describe a four-quandrant multiplier and divider based on the widely known principle of pulse-time multiplication. A block diagram of the device is shown and its operation is explained. The device has a maximum relative error of 0.1% in an ambient temperature range from 0 to +60C. A schematic diagram is given for the electronic part of the device together with a detailed description of its operation. The circuit of the device is divided into two sections. The first section contains a sawtooth voltage generator, common collector amplifier, Schmitt trigger circuit, and two pulsed voltage dividers. The operation of the voltage dividers is illustrated by time diagrams. This first section is used for pdm and pam of the square-wave voltage. The second section of the multiplier-divider is a d-c amplifier. This unit has a voltage amplification factor of 20,000, input impedence of 5 KΩ, and a maximum zero drift at the output of 0.4 mv from +20 to +60C. Data are given on error

Card 1/2 UDC: 681.142.642.3/4

L 8797-66

ACC NR: AP5026965

analysis of the device. The unit has a passband of 10 cps in one channel and 8.5 cps in the other. Results of experimental tests are given. Orig. art. has: 2 figures and 13 formulas.

SUB CODE: 09 / SUBM DATE: 18Mar65 / ORIG REF: 001 / OTH REF: 002

jw

Card 2/2

ACC NR: AP7004140 SOURCE CODE: UR/0051/67/022/001/0107/0114

AUTHOR: Tarasov, Yu. A.

ORG: none

TITLE: Kinetics of emission processes in lasers

SOURCE: Optika i spektroskopiya, v. 22, no. 1, 1967, 107-114

TOPIC TAGS: laser emission, laser theory, quantum electronics, electronic transient radiation, laser cavity, laser radiation spectrum

ABSTRACT: In view of the fact that earlier approaches to the theory of emission processes in lasers usually do not take into account the start of the emission process, which is quantum mechanical in character, the author derives equations describing the interaction of a system of two-level atoms with the radiation field and which take into account the quantum character of the start of the process. The emission-kinetics equations are first derived for a resonator with ideally reflecting walls, after which corrections are introduced for scattering by impurities, absorption in the laser rod, diffraction losses, and other factors. The transients occurring in the photon density just prior to the onset of the stationary mode are then studied, and an expression is obtained for the width of the spectrum. Further refinements of the theory call for a determination of the cause of some undamped oscillations in the emission intensity obtained at small values of the threshold, and for a more rigorous allowance for the geometrical properties of the system. The author thanks T. N. Zubarev and A.

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UDC: 621.375.9: 535.01

ACC NR: AF1004140

K. Sokolov for useful discussions. Orig. art. has: 19 formulas. [WA-14] [02]

SUB CODE: 20/ SUBM DATE: 12May65/ ORIG REF: 005/ OTH REF: 007

Card 2/2

L 15513-63 BDS

ACCESSION NR: AP3006401 S/0119/63/000/008/0017/0018

AUTHOR: Tarasov, Yu. A. 48

TITLE: Transistorized precision voltage comparator 10

SOURCE: Priborostroyeniye, no. 8, 1963, 17-18

TOPIC TAGS: transistorized precision comparator, transistorized comparator, comparator, comparing circuit, computer comparing circuit

ABSTRACT: Commonly used voltage comparators based on transistorized amplifiers and triggers possess low stability during the replacement of transistors, variations in power supply, and changes of ambient temperature. A voltage comparator, which to a considerable degree is free of these deficiencies, is described. Its circuit diagram is shown in Fig. 1 of the Enclosure. The input voltage U_{In} and constant reference voltage U_{Ref} is applied to a summing network consisting of MT-MN-0.5 resistors R_1 and R_2. The comparison takes place at the moment when the voltage polarity at point a changes. The control of this moment for a given input voltage is obtained by varying U_{Ref} or R_2. The voltage at point a is converted into pulses by the VP-55 converter or the PP-58 transistorized converter. The two-stage RC amplifier uses P16B germanium triodes TK_1 and TK_2,

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ACCESSION NR: AP3006401

which maintain a current gain between 45 and 100 and have increased sensitivity and reliability. Negative feedback by means of dividers R_3-R_5 and R_7-R_8-R_1 is introduced to stabilize the circuit against temperature variations. A local positive feedback (R_{11}-R_{12}-R_6-C_6) is used to increase sensitivity. Capacitor C_4 reduces the a-c negative feedback in the second stage. The second terminal of the converter serves as a phase-sensitive demodulator of rectangular pulses. An integrating negative feedback amplifier with two parallel silicon junction transistors TK_3 serves as an output stage. The ohmic resistance of relay p serves as a collector load. Experiments with the P-55 vibrator demonstrate that the zone of sensitivity is 3—5 mv under normal conditions; the shift of this zone after two hours of heating with or without voltage supply does not exceed 7 mv. The operation is not affected by a voltage variation of as much as 10%. Due to its high stability, sensitivity, and high input resistance, this comparator can be used in electronic integrators. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 00	DATE ACQ: 23Sep63	ENCL: 01
SUB CODE: GE	NO REF SOV: 003	OTHER: 001

Card 2/3

S/146/63/006/001/006/014
D201/D308

AUTHOR: Tarasov, Yu. A.

TITLE: Parametric compensation of leakage in RC-integrators

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye, v. 6, no. 1, 1963, 58-66

TEXT: The author shows that the error of a negative feedback RC-integrator, due to the leakage of the feedback capacitor, may be compensated either by introducing additional positive feedback or by simulating the error signal and by the subsequent algebraic addition of it to the output voltage of the integrator. Several compensation circuits are suggested which have been experimentally tried in amplifiers with automatic drift stabilization. Theory and experimental results show that the positive feedback introduced into electronic RC-integrators will partially compensate for errors due to the leakage resistance of capacitors, and that RC-integrators, error-compensated by error signal simulation, are on a par with step-by-step integrators with integration times as long

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Parametric compensation of ...

as 30 to 60 minutes. At the same time, they are of simpler design and construction as compared with the typical operational amplifiers using reference devices. The main disadvantage of these integrators is the impossibility of full error compensation over the whole time interval. Full compensation can be achieved using polystyrene capacitors (T-50,000 sec), e.g. ПГ-М (PG-M). In this case, however, the integration periods are limited because of the small capacitance values which in turn lead to increased errors due to drift. There are 6 figures.

ASSOCIATION: Ryazanskiy radiotekhnicheskiy institut (Ryazan' Institute of Radio Engineering)

SUBMITTED: April 5, 1962

Card 2/2

L 17909-63

ACCESSION NR: AP3005677 S/0146/63/006/004/0044/0053

45

AUTHOR: Tarasov, Yu. A.

TITLE: Using silicon diodes in squarer-type multipliers without reference voltages

SOURCE: IVUZ. Priborostroyeniye, v. 6, no. 4, 1963, 44-53

TOPIC TAGS: silicon diode, multiplier, squarer, reference voltage

ABSTRACT: Thyrite and similar-material analog multipliers have those drawbacks: necessity of testing the characteristics of each thyrite resistor; complicated analytical calculation of squarers for determining linear deforming resistance; and impossibility of adjusting the parabola sections separately. New multipliers free from the above shortcomings are offered in the article; they can multiply two voltages within -100 +100 v or -10 +10 v by means of silicon junction or point-contact diodes operating in square-law function generator circuits

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L 17909-63
ACCESSION NR: AP3005677

without reference voltages. Characteristics and operation of D808, D810, and D813 stabilitrons are considered and found inferior to those of D202-D211 and D104-D106 silicon diodes. Simplified electrical circuits of multipliers with D105A silicon diodes are examined. Experimental verification of these circuits revealed that the maximum static error of reproducing the parabola was 0.1-0.2% of full scale at 100 v and 10 v; maximum multiplication error was 0.2-0.4% at normal temperature. The following advantages are claimed: (1) smaller number of diodes; (2) much lower temperature error; (3) simplicity, reliability, and economy. Orig. art. has: 6 figures and 11 formulas.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Lenina (Leningrad Electrotechnical Institute)

SUBMITTED: 22May62 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: CP NO REF SOV: 008 OTHER: 000

Card 2/2

ACCESSION NR: AP4007707 S/0146/63/006/006/0145/0148

AUTHOR: Tarasov, Yu. A.

TITLE: Diode functional converter without reference voltages

SOURCE: IVUZ. Priborostroyeniye, v. 6, no. 6, 1963, 145-148

TOPIC TAGS: functional converter, diode functional converter, Zener diode functional converter, function approximation, signal approximation, stabilivolt, diode

ABSTRACT: A block diagram is suggested for simulating functions with monotonically decreasing derivatives by a method of piecewise-linear approximation. Depending on the range of measurement of the input voltage, the actual circuit can be materialized with stabilivolts or with Zener diodes. The circuit designed with D808-D810 stabilivolts at 10-100 v and with D104 diodes at 1-10 v was tested as a logarithmic approximator and exhibited an error of 0.1%. Upon

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ACCESSION NR: AP4007707

heating to 60C, the error rose in the first approximator to 2% and in the second to 16%; an MMT-4 thermistor inserted in the amplifier feedback corrected the latter error to 1.8%. These advantages are claimed for the circuit: simplicity of design and alignment, accuracy, versatility, and independence of approximation from stabilivolt characteristics. Orig. art. has: 1 figure and 3 formulas.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Lenina (Leningrad Electrotechnical Institute)

SUBMITTED: 18Mar63 DATE ACQ: 20Jan64 ENCL: 00

SUB CODE: SD NO REF SOV: 005 OTHER: 002

Card 2/2

L 50744-65 EWT(d)/EWT(1)/EED-2/EWP(1)/EWA(h) Pq-4/Pg-4/Pab/Pi-4/Pl-4
IJP(c) BB/GG

ACCESSION NR: AP5015335 UR/0286/65/000/009/0091/0091
681.142

48
47
B

AUTHOR: Tarasov, Yu. A.

TITLE: Function converter. 25 Class 42, No. 170751

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 91

TOPIC TAGS: function converter, analog computer, simulator

ABSTRACT: This Author's Certificate introduces a function converter for simulating monotonically increasing functions. The device contains a summing amplifier and provision is made for nonlinearity, e.g. in the form of diodes. The converter is designed for simplicity, high accuracy and reliability of operation. A parallel group of dividers (the number of which depends on the number of approximation units) is connected in parallel to the converter input. The outputs of the dividers are fed to the input of the summing amplifier through nonlinear elements in the form of point contact or junction diodes.

ASSOCIATION: Leningradskiy elektrotekhnicheskiy institut im. V. I. Ul'yanova

Card 1/3

L 50744-65
ACCESSION NR: AP5015335

(Lenina) (Leningrad Electrical Engineering Institute)

SUBMITTED: 29Jan62 ENCL: 01 SUB CODE: DP, EC

NO REF SOV: 000 OTHER: 000

Card 2/3

L 50744-65
ACCESSION NR: AP5015335

ENCLOSURE: 01

0

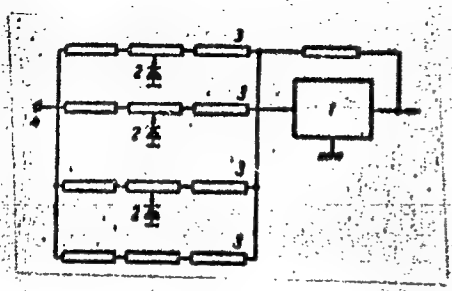

Fig. 1. 1--summing amplifier; 2--diodes; 3--resistor dividers; 4--converter input

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L 6995-66 EWT(d)/EWP(1) IJP(c) GG/BB

ACC NR: AP5026791 SOURCE CODE: UR/0286/65/000/017/0074/0074

AUTHOR: Tarasov, Yu. A.

52

B

ORG: none

TITLE: An integrator. Class 42, No. 174382 [announced by Leningrad Electrical Engineering Institute im. V. I. U.'yanov (Lenin) (Leningradskiy elektrotekhnicheskiy institut)]

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 17, 1965, 74

TOPIC TAGS: electronic integrator, computer component, error correction, electronic feedback

ABSTRACT: This Author's Certificate introduces: 1. An integrator containing two amplifiers with series-connected negative feedback and a summation unit. Parametric compensation for the error due to leakage of the integrating capacitor is provided by connecting the output of the first basic amplifier through a divider to the input of the second amplifier. The outputs of both amplifiers are connected to the inputs of the summation unit. 2. A modification of this device in which more effective error compensation is provided by using preliminary compensation in the first basic amplifier. This is accomplished through the use of positive feedback by connecting the input signal source and the output of this amplifier through resistors to the input of the same amplifier.

UDC: 681.142.07

SUB CODE: DP,EC/ SUBM DATE: 31Jul63/ ORIG REF: 000/ OTH REF: 000

Card 1/1

0901 1914

TARASOV, Yu.A.

Width of a laser radiation spectrum. Dokl. AN SSSR 165 no.3: 537-540 N '65. (MIRA 18:11)

1. Submitted March 19, 1965.

L 21431-66 EPD/EWT(1)/EEC(k)-2/T/EWP(k)/EWA(h) IJP(c) WG

ACC NR: AP6009645 SOURCE CODE: UR/0181/66/008/003/0696/0704

AUTHOR: Alekseyev, A. I.; Tarasov, Yu. A.

ORG: Moscow Engineering Physics Institute (Moskovskiy inzhenerno-fizicheskiy institut)

TITLE: Steady-state oscillation regime in a laser

SOURCE: Fizika tverdogo tela, v. 8, no. 3, 1966, 696-704

TOPIC TAGS: laser, pump power, solid state laser, laser theory

ABSTRACT: A system of equations for the vector potential, polarization current, and overpopulation of levels suggested earlier by one of the authors (Zh. ETF, v. 48, 1965, p. 879) is used to investigate the electromagnetic oscillations in a solid state laser operating near the steady-state regime. The analysis includes all of the possible modes. The frequency and the intensity of emission in a steady-state regime are determined for the case when the pump power is large and the condition for stability of oscillations is established. It is shown that the laser oscillator equations (W. Kaiser et al., Phys. Rev. v. 123, no. 3, p. 766) describing kinetics of the emission process and photon absorption by resonance two-level molecules in the presence of continuous pumping and losses follow from the initial system of equations. The laser oscillator equations apply only when there is a sufficiently large devia-

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L 21431-66

ACC NR: AP6009645

tion of energy levels of molecules from the exact resonance. In the case of narrow resonance even emission of a photon becomes a collective phenomenon and the usual laser oscillator equations no longer apply. Orig. art. has: 38 formulas. [CS]

SUB CODE: 20/ SUBM DATE: 15Jul65/ ORIG REF: 008/ OTH REF: 012/ ATD PRESS: 4221

Card 2/2 ULR

TARASOV, Yu.A.

Selecting group marameters in grouping seismographs. Izv.vys.uchab. zav.; neft' i gaz 1 no.9:23-29 ' 58. (MIRA 11:12)

1. Groznenskiy neftyanoy institut.
(Seismology).

14(5)

AUTHOR: Tarasov, Yu. A. SOV/152-59-3-4/25

TITLE: On the Significance of the Curvature of the Hodograph of the Reflected Wave With Regard to the Arrangement of Seismoreceivers (O znachenii krivizny godografa otrazhennoy volny pri gruppirovanii seysmopriyemnikov)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Neft' i gaz, 1959, Nr 3, pp 17-24 (USSR)

ABSTRACT: With regard to the theory of the directed effect of interference systems as applied for seismic observation several simplifying prerequisites are made. Among these there is, above all, the assumption that within the range of the receiver system the seismic wave is plane. The case of a curved wave is investigated and the effect of the curvature is demonstrated by an example. According to the calculated diagrams it was found that considering the small usual distances of the measuring points from one another the curvature remains without effect. In special cases, however, when the measuring basis is of wide extent, the seismoreceivers can be arranged by means of the diagrams in such a manner as to avoid all disturbing refraction and scattering waves. The calculations have merely the nature

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On the Significance of the Curvature of the Hodograph of the Reflected Wave With Regard to the Arrangement of Seismoreceivers SOV/152-59-3-4/25

of approximations and are considered to be an estimation of the order of magnitude. There are 5 figures and 3 Soviet references.

ASSOCIATION: Groznenskiy neftyanoy institut (Groznyy Petroleum Institute)

SUBMITTED: August 7, 1958

Card 2/2

TABAKOPULO, N.P., inzhener; TARASOV, Yu.A., inzhener.

Separating pyrite and arsenopyrite by flotation. TSvet. met. 29 no.8:4-9 Ag '56. (MLRA 9:10)

1. Darasunskaya obogatitel'naya fabrika.
(Pyrites) (Arsenopyrite) (Darasun--Flotation)

CHUMAKOV, L.I.; TARASOV, Yu.A.

Using flotation machines for cyaniding gold-bearing ores.
TSvet. met. 29 no.10:10-12 O '56. (MLRA 9:12)

(Cyanide process)

Tarasov, Yu. A.

136-3-14/25

AUTHORS: Tarasov, Yu. A. and Nazarov, V. I., Engineers.

TITLE: Measurement of the Quantity of Sucked-In Air in Flotation Machines. (Zamer kolichestva zasasyvayemogo vozdukha vo flotatsionnykh mashinakh).

PERIODICAL: Tsvetnyye Metally, 1957, No.3, pp.75-76 (USSR)

ABSTRACT: The quantity of air sucked into flotation machines gives indications of the state of the processes and plant and an instrument for measuring this has been devised by the authors on the basis of an ordinary anemometer. The instrument ("aerometer") is in successful use at the Darsun beneficiation works and can be used for each chamber. A brief description and conversion equations are given. There are 2 figures.

1/1

AVAILABLE: Library of Congress

Tab. N.P.

AUTHORS: Tabakopulo, N.P., and Tarasov, Yu.A. 136-12-1/18

TITLE: Final Extraction of Metals from Tailings by De-sliming and Flotation (Doizvlecheniye metallov iz otval'nykh khvostov obesshlamlivaniyem i flotatsiyey)

PERIODICAL: Tsvetnyye Metally, 1957, 30 No.12, pp. 1 - 6 (USSR)

ABSTRACT: At the Darasun Concentration Plant, , gold polymetallic sulphide ores are treated, gold losses occurring mainly with arsenopyrites (Ref.1). The authors discuss gold distribution in different size ranges of the tailings and mention that although a two-stage flotation was recommended as being capable of reducing gold loss to 0.4 - 0.5 g/ton, this has not been adopted because the plant was designed for single-stage flotation. They outline work aimed at developing a method suitable for the conditions at Darasun . . The procedure adopted was based on practice at White Pine (USA) (Ref.4) on the repeated flotation of tailings after their preliminary de-sliming. V.V. Pasechnikova, Engineer, participated in the successful laboratory testing of the method. The authors describe the full-scale testing of the method with the use of 350 mm diameter hydrocyclones, giving the flowsheet (Fig.1) and data on hydrocyclones efficiency (Figs. 2, 3) and explain the relatively low

Card1/2 efficiency when the content of gold and arsenic in the general

Final Extraction of Metals from Tailings by De-sliming and Flotation

tailings was abnormally high. They give full-scale results confirming the combination with arseno-pyrite of the gold remaining in the collective flotation tailings. Discussing plant operation before and after the introduction of the new method (Table 3), the authors conclude that the additional operating costs are soon recouped by gold-recovery profits at the rate of 700 000 roubles per annum.
There are 4 figures, 3 tables and 3 Russian and 1 English references.

ASSOCIATION: Darasun Concentration Plant (Darasunskaya obogatitel'naya fabrika)

AVAILABLE: Library of Congress

Card 2/2

SOV/137-58-10-20394

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 6 (USSR)

AUTHOR: Tarasov, Yu. A.

TITLE: Industrial Tests of a Worm-type Separator (Promyshlennyye ispytaniya vintogogo separatora)

PERIODICAL: Kolyma, 1958, Nr 2, pp 23-24

ABSTRACT: At the Darasun dressing plant, which treats Au-bearing polymetallic ores with pyrite, arsenopyrite, chalcopyrite, galena, and sphalerite, the concentration process includes pulsator jigging of the starting ore and flotation of the pulsator-jigging tailings, comminuted to under 0.2 mm. Final extraction from the flotation tailings of the Au and of concretions thereof with sulfides is performed by pulsator-jigging machines, model 2-OVM-3 and by the M-3 worm-type separator (WS). The tests establish that the use of WS is more practical and economical than that of pulsator jigs. The use of WS may be recommended for high recovery of valuable components from dressing-mill tailings if the preponderant majority of the mineral grains are >0.15 mm. Grains <0.15 mm should be removed prior to separation, as they do not lend themselves to satisfactory separation by WS.

Card 1/1 K. A. 1. Ores--Properties 2. Gold--Separation 3. Separators--Performance 4. Separators--Test results

MITRYASHIN, M.L., inzh.; TARASOV, Yu.D., inzh.

Automatically controlled sand and gravel plants. Stroi. mat. 5 no.10:8-11 O '59. (MIRA 13:2)
(Sand and gravel plants) (Automation)

TARASOV, Yu.D., inzh.

Vibration cleaner of conveyer belts. Gor.shur. no.7:74-75 Jl '60. (MIRA 13:7)

1. Institut Gipronemetrud, Leningrad.
(Conveying machinery—Cleaning)
(Vibrators)

TARASOV, Yu.D., inzh.

Controlling the skidding of electric tilting drum cars. Stroi.mat.7 no.2:19-21 F '61. (MIRA 14:3)
(Conveying machinery)

TARASOV, Yu.D., inzh.

New belt checking device for inclined conveyors. Stroi.mat. 8 no.3:15 Mr '62. (MIRA 15:8)
(Conveying machinery—Equipment and supplies)

TARASOV, Yu.D., inzh.

Diagram of an automatic loading arrangement for circular rope haulage by nondetachable cars. Izv. vys. ucheb. zav.; gor. zhur. 6 no.10:46-49 '63. (MIRA 17:2)

1. Leningradskiy ordena Lenina i Trudovogo Krasnogo Znameni gornyy institut imeni G.V. Plekhanova.

TARASOV, Yu.D., inzh.; VARLAMOV, S.I., inzh.

Technical design and operation of a large crushing and grading plant. Stroi.mat. 9 no.3:1-5 Mr '63. (MIRA 16:4)
(Crushed stone industry—Equipment and supplies)